fourth week compares favorably with that of the opposite testicle.[8] The everted tunica gradually retracts in the direction of the testicle, forming a dense compressing sheath to the inclosed vessels. Palpation of the lower portion of the cord illustrates these facts conclusively. The appearance of the scrotum on the operated side shows the effect of the new position occupied by the testicle.

Results.—Having operated only five times during the past year by the above described method, I can offer but very meager data upon the all-important chapter of results. Two classes of cases were treated: First, painful varicoceles (two cases); second, voluminous varicoceles (three cases). In the first class the painful symptoms ceased as early as the third day. In one of these cases the testicle showed an appreciable increase in size shortly after the operation. In the three cases of voluminous varicocele the scrotum soon retracted to the new position occupied by the testicle. Palpation showed collapse of the spermatic veins in all three cases, and in one case a slight dilatation of the veins in the region of the globus minor. None of the patients wear a suspensory. Sufficient time has not elapsed to warrant conclusions regarding late results.

From numerous experiments on animals, I was able to demonstrate the following facts:

First, a new collateral venous circulation as evidenced by loose and very vascular connections between the albuginea and the surrounding cellular tissue.

Second, an increased normal collateral circulation, as illustrated by the marked development of the intra-testicular vessels and the great development of the veins in the scrotal ligament leading from the testicle to the walls of the scrotum.

Third, numerous macroscopic and microscopic sections of the testes failed to reveal degenerative lesions. Active spermatozoæ were invariably found in the vas in each of the above experimental cases, the majority of which were examined six and nine weeks after operation.

Fourth, a new fibrous capsule may be noted as early as the second month after operation. This may account for the rare cases of recurrence after total excision of the tunica.

Operative Indications.—In civil life, varicocele is not looked upon as of any moment, and it can be truly stated that, excepting in applicants for the army and navy or for positions in some public departments, operations are very seldom necessary, or even justifiable.[9]

In the military and naval circles of this country alone much importance is attached to varicocele, and the expediency of its treatment by operation was not long ago urged in a widely circulated report emanating from the office of the surgeon-general. Hence, the vast number of such interventions in military hospitals. However, the high character of the recent work of the medical department of the United States army amply compensates for the above egregious blunder. In the great armies of France, Italy and Belgium varicocele operations are of excessive rarity (Dardignac).

The treatment of the vast proportion of varicoceles in sane individuals calls for nothing more than the temporary use of the suspensory and some local hydrotherapeutic measure.

The following, modified after Sébileau, is presented as a resumé of the operative indications in varicocele:

One should operate.	1. Large or painful varicocele, inducing testicular atrophy or marked endophlebitis. 2. Varicocele causing the rejection of candidates for certain positions (army and navy).
One may operate.	1. Voluminous, painless varicocele, equivalent to an appreciable deformity. 2. Smaller varicocele at the patient's repeated request to be rid of an infirmity.
One should never operate.	1. Varicocele in genito-urinary hypochondriacs or in neuresthenics. 2. Simple dilatation of the veins inducing no symptoms. (The most common form of varicocele.)

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[9]During six years of work in the Paris hospitals, I saw fewer operations for varicocele than during a period of six months in this country; two recognized surgical authorities in that city (Trelat and Le Fort) had never, in twenty years of hospital service, observed a varicocele requiring operation.

[8]See page 366.

TREATMENT OF TYPHOID FEVER.

By RAY LYMAN WILBUR, M. D., Stanford University.

(*Continued from page* 345.)

Drugs.—The drug most used was a teaspoonful dose of saturated solution of magnesium sulphate, one to three times a day, and it usually did very well. At the very onset of each case, and frequently thereafter, when the constipation or the fermentation were troublesome, calomel in small doses (¼ grain), with sodium carbonate (1 grain), repeated every half hour for three to six doses, and followed by milk of magnesia ℥ss, was most useful. Later, in many of the cases, the ordinary compound rhei pills or compound licorice powder were used with success. Pills containing aloes, or, in fact, the vegetable products in general, should not be used during the period of active ulceration; for the form of peristalsis which most of them excite is, in my opinion, more apt to induce hemorrhage.

Treatment of Hemorrhage.—Nine cases of severe hemorrhage came under observation. Of these cases, one patient died from hemorrhage (autopsy), one probably from perforation following hemorrhage (no autopsy), one from perforations four days subsequent to hemorrhage (autopsy), one four weeks after hemorrhage from a general toxic condition, endocarditis and embolism. The treatment of these cases was as follows: First, the nurse was in each case fully instructed what to do if blood appeared in the stools, or the temperature suddenly dropped without evident explanation, or the patient's' thirst or pallor suddenly increased with coincident weakness of pulse. Elevation of the hips, absolute rest in bed

on the back, two ice coils and two or three large, flat ice bags to the abdomen, no food or fluid by stomach except as given below, all routine orders stopped. Hypodermic injections of 15 to 30 minims of fluid extract ergot (prepared for injection) is to be given, to be repeated in two hours or sooner, and the patient is given by the mouth, in a small amount of water, 1 grain of fresh gum or powdered opium every one to four hours, according to the symptoms and the amount of peristalsis. If pulse is no better following ergot, give a hypodermic of 30 minims of brandy; if still no better, use strychnin 1-30 of a grain hypodermically, but in no case nitro-glycerin, because of its vasodilator effect. It is better not to stimulate unless absolutely needed, as arterial pressure, and hence hemorrhage, is increased. *In case the bleeding persisted in spite of above measures, and the pulse became thready and uneven, a saline infusion of from one to two pints was given, usually under the breast. This seemed always to be beneficial, and in one case of a most severe hemorrhage, undoubtedly saved the patient's life. It was also helpful in allaying thirst. In two fatal cases it was interesting to note that it was not absorbed. Nothing except the opium pills, with enough water to wash them down, was put into the stomach for twenty-four to thirty-six hours; then a few drops of Valentine's beef juice in a couple of teaspoons of water was given. Careful observations were made with the stethoscope of the amount of peristalsis during the frequent visits that all hemorrhage cases require. If the hemorrhage was controlled and the heart promptly recovered, the ergot was stopped at the end of twenty-four hours, the opium at the end of forty-eight hours, unless given up before on account of signs of opium poisoning, the stimulants used only when absolutely required, and the beef juice and ice water were given every two or three hours for the second twenty-four hours; the ice to the abdomen was continued for several days. It was found that beef juice or liquid peptonoids, especially when given alone, soon had a laxative effect, probably due to peptones contained, and so they were usually stopped at the end of forty-eight hours, and predigested slightly diluted milk ʒi to ʒss every one to two hours was given. Absolute rest on the back was continued for from forty-eight to eighty hours. When conditions were going favorably, the turpentine oil emulsion in small, frequently repeated doses was begun in twenty-four to thirty-six hours after the hemorrhage, and continued for some days. The bowels were in no way disturbed until the fourth day, and then a glycerin enema was used. Full feeding was given at the end of one week, and a mild bowel cathartic was used then, also, if needed. Hypodermic injections of morphin were found to induce vomiting, and not to control the peristalsis as well as the powdered or gum opium. In the more desperate cases where the hemorrhages were uncontrolled by the above measures, and more particularly in one of the fatal cases, where the blood was passed unclotted, calcium chlorid, fused, 5 to 15 grains was given in a small amount of water by the mouth, and thick gelatine broth (made from pure gelatine and a few drops of beef juice) was given in a small quantity. Whether these measures were beneficial, I am unable to state, but in this case some clotted blood was passed before death. There was a history of some hemophelia in the family. Epinephrin (1-1,000 sol.) was used in two cases; one of the patients died from hemorrhage (autopsy), and one of apparent perforation following hemorrhage. It was given in small quantities 2 to 30 drops in small amounts of water by mouth every half hour for some hours. Its effect upon the tone of the heart and the pulse was noticeable, but any control of the hemorrhage was limited and not permanent in its effect. Unless its vasoconstrictor effect with increased blood pressure is steady and lasting, its value is most dubious, and it is hard to know which is better, the low pressure following the hemorrhage with its tendency to allow coagulation, or the use of stimulants and vasoconstrictors, favoring higher pressure and smaller bleeding surfaces. I feel convinced that only very careful and conscientious observations will be able to tell us whether it does harm or good in such cases. The mucous membrane of the stomach of the autopsied patient was markedly congested and hemorrhagic in appearance. a condition that I ascribed to the local effect upon the stomach wall of the epinephrin. It is necessary to state that this patient had at some time during the prolonged illness, hemorrhages from the nose, bowel, uterus, bladder or kidney and from the stomach.

Collapse.—The most striking characteristic of the cases observed were these circulatory collapses. They appeared in severe afebrile cases, as well as in those with highest temperature, regardless of treatment given previously, and were evidently due to the severity of infection. It is of interest to note that they never occurred during an ice pack. The first collapse was difficult to treat because of the fear that it might mean hemorrhage or perforation, but it was thought safer to assume the second one in the same case as collapse, and so treat it vigorously from the outset. Severe collapses were noted in eighteen cases. They were most startling in character, and several times I was told over the telephone that the patient was dead, only to find him getting better, under the routine ordered, when I reached the house. The temperature would frequently fall, even below 96° or 95° F., the pulse disappear from the wrist, and the patient lie apparently lifeless. This happened no fewer than eight times in one patient, the man eventually recovering. His skin became so tough at times that it was difficult to insert a hypodermic needle, and injections made at that time, if not made deeply, produced superficial sloughs.

The routine ordered for the first collapse was as follows: Remove all applications of cold, place hot applications to the feet and the sides of the body (but not to the abdomen), rub the extremities, inject at once 1-30 grain of strychnin and 100 minims of brandy. If not immediate favorable result, repeat the brandy and then in succession give a hypodermic of camphorated oil 10% (20 minims), then ether 10 to 20 minims in equal parts of olive oil; then if still no pulse at wrist, give ii grains caffein citrate hypodermically in warm solution, and repeat camphorated oil and ether and oil alternately every ten to twenty minutes until there is a noticeable result. In case it was reasonably sure that there was not a hemorrhage, 1-50th of a grain of nitro-glycerin was added to the first injection, and this was repeated in two or three hours if needed. The after-treatment of an attack was a most careful stimulation with brandy, strychnin and nitro-glycerin, with the use of small quantities of hot foods and drinks and the use of warm applications until the temperature began to rise. Such treatment may seem drastic, but its prompt use saved several patients for me, and saved three of them over and over again. Collapse cases had always ready for use hypodermic syringes filled with the above solutions, so that no time was lost. In one case where the ether and oil was used it took sixty-five seconds for an imperceptible pulse at the wrist to become plainly perceptible. Because of the severe type of infection in many of these cases, there was a good chance to prove the great value of camphor and ether, as heart stimulants especially. The great essential in the treatment of such a complication is to be prepared, so that *no time is lost* filling syringes or sending to the drug store or for the physician. The nurse must act at once, and must know what to do.

*Strychnin was used when there had to be a choice between two evils, and when the circulatory danger overbalanced the fear of exaggerated peristalsis. Caffein was found particularly valuable for stimulation when opium was being given, and it did not seem to noticeably increase the peristalsis.

Perforation.—Four cases of perforation came under my observation, with one other probable case; two of these patients died. No operations were performed. The treatment was almost identical with that for hemorrhage, with the exception that no epinephrin or calcium chlorid was used, and that feeding was not begun until the end of the third day, except for small amounts of beef juice at the end of twenty-four to thirty-six hours. The results were very satisfactory in two cases, though in one case it was very difficult later to bring about a bowel action and to reduce the immense distension of the abdomen. This was finally accomplished by hot turpentine stupes to the abdomen, turpentine by mouth and per rectum, and small doses of calomel. In one fatal case death was due to a second perforation into the free peritoneal cavity high up in the small bowel the third day after the first perforation in the iliac region. The autopsy showed that the first perforation under the above treatment had become completely walled off from the peritoneal cavity, and, although the perforation in the cecum was as large as a 25-cent piece, recovery would probably have followed except for the severity of the infection and the second perforation. My observation in these cases leads me to doubt the advisability of surgical treatment, except in perforation during convalescence. To submit a patient in such a profound state of infection and collapse to an abdominal operation, and the manipulation and sewing of a thoroughly diseased bowel, seems to me questionable treatment, unless done immediately and under the most favorable circumstances. If peristalsis can be promptly controlled, the hope of recovery is fairly good without operation, and the risks of an operation, particularly where the condition is doubtful, are very great.

Pneumonia, as a severe complication, was met five times, and no patients were lost, although one had a temperature of from 104.5° to 106° F., a pulse 140 to uncountable, and respiration 50 to 80, for several days. The treatment was one of stimulation, oiled silk jacket to chest and oxygen inhalations. Particularly valuable in controlling the cyanotic attacks was the inhalation of turpentine fumes, from turpentine placed on hot water. The ether and camphor was used freely hypodermically when needed, and the most desperate cases recovered finally, having taken over ʒii each of 10% camphorated oil and ether and oil aa within a week's time. The oxygen was found very valuable when intermittently administered. No expectorants were used because of the need of all possible nourishment by the patient and the fear of digestive disturbance, although oil of eucalyptus, tincture of benzoin compound and oil of white pine, āā, were vaporized in the room constantly.

In conclusion, I would say that the great thing in the treatment of a typhoid case is a careful study of the patient and his surroundings, of all the evidences that we can discover of the reaction of each organ to the toxins damaging it, and of a most detailed and painstaking attempt to help his system in every way; but above all to see that he digests and eliminates properly.

MYOCARDITIS, WITH SPECIAL REFERENCE TO DISORDERED METABOLISM.

By DR. W. W. KERR, San Francisco.

(*Continued from page* 343.)

A recollection of the physiological effects of these baths will always guide us in the selection of suitable cases as well as in determining the line of treatment adapted to each individual. As the temperature of the bath is from 3° F. to 10° F. below that of the body, the first influence is a contraction of the peripheral vessels, followed by reaction and then dilatation, a change that generally takes place during immersion, but which may be delayed until the period of rest, when the patient has been removed from the bath. This is associated with stronger but slower heart action, so that, as a result of the combined effects, we should have an improved circulation through general, pulmonary, and portal systems. According to Schott, this is accomplished by the influence of the carbonic acid and salts upon the skin, and also by their absorption into the corium, so that they have a prolonged effect upon the peripheral nerves and reflexly influence the vaso-motor system.

Cases of arterio-sclerosis so advanced that the vessels may not react, and patients suffering from myocarditis of such a degree that it is doubtful whether the heart muscle will endure the strain, must always be treated with the greatest care, the period of immersion should be short and the amount of mineral salts and gas in the bath very small; should the patient improve, the bath may be made stronger and the immersion longer, but if he should fail to react, then the bathing should be abandoned entirely or temporarily until the resistance movements have rehabilitated the cardiac muscle.

The treatment is also of diagnostic value, because the readiness with which the heart responds to it enables us to form some opinion regarding the reserve power of the myocardium. Patients who are too weak to use the baths, or are so situated that they cannot obtain them, are frequently benefited by the resistance movements; but these must also be conducted with caution in regard to degree of resistance, variety of movement and duration of treatment, any increase in dyspnea or the onset of precordial distress being an indication for rest and diminution in amount of resistance. What has been said is not to be taken as in any way approaching a full description of the Nauheim treatment; it is only an attempt to indicate in the few words that are possible in this lecture the points that should influence the adoption of the method, and also it is intended to emphasize the fact that dosage in regard to temperature of bath, amount of minerals and gas present, and period of immersion is as important in this as it is in the medicinal treatment. The pamphlets issued with the artificial salts give instructions regarding the amount of salt to be used in fifty gallons of water, but my experience has been that a comparatively large number of nurses, and physicians also, have very hazy ideas regarding the volume occupied by fifty gallons of water, and therefore, as has been already said, the treatment is haphazard, and failures are attributed to the method which in many cases are due to the ignorance or carelessness of the physician. If the attendant measures the cubic space occupied by the water in a bathtub, and remembers that every cubic foot of water corresponds to practically 6.25 gallons, he will then know how much of the salt should be added to bring it to the desired percentage. This a bath 5 feet long, 20 inches wide, and in which the water is 9 inches deep before the immersion of the patient, would contain (60 in. × 20 in. × 9 in.) 6.3 cubic feet of water, and therefore 6.3×6.25 gallons=39.375.

While the baths can be given at home, the treatment is generally conducted with better results at a sanitarium, for various reasons: the bathtubs are longer than those generally found in private dwellings, so that the patient can lie in a more nearly horizontal position, and be more comfortable; the attendants are better trained to this individual class of work, and the immediate effects of each bath can be noted by the resident physician; futhermore, at a sanitarium the treatment becomes the main feature in the patient's daily life, while at home it is very difficult to keep him free from disturbing influences.

A full account of this method and its results will be found in the writings of Schott, Bezly-Thorne, Leith and others who have given the subject special attention, and I would only add that the experience of succeeding years only more thoroughly establishes